Math 142, Fall 2000, Exam 3

PRINT Your Name: __________________________

There are 10 problems on 5 pages. Each problem is worth 10 points. Each. SHOW your work. CIRCLE your answer. NO CALCULATORS! CHECK your answer whenever possible.

1. Find \( \int x\sqrt{1-x} \, dx \).

2. Find \( \int x\sqrt{1-x^2} \, dx \).

3. Find \( \int \sqrt{1-x^2} \, dx \).

4. Find \( \int xe^x \, dx \).

5. Find \( \int xe^{x^2} \, dx \).

6. Find \( \int_{-3}^{1} \frac{1}{x^2} \, dx \).

7. Find \( \lim_{x \to \infty} \frac{e^{-x}}{x-1} \).

8. Find \( \int \frac{2x^3 + 5x^2 + x + 3}{x^2(x^2 + 1)} \, dx \).

9. Find the third Taylor polynomial \( P_3(x) \) for \( f(x) = \ln(x+1) \) about \( a = 0 \).

10. Take \( P_3(x) \) and \( f(x) \) from problem 9. Find an upper bound for the error that is introduced if \( f(x) \) is approximated by \( P_3(x) \) for \(|x| \leq \frac{1}{100}\).